Letter to editor

**Decompressive hinge craniotomy as an alternative for low-resource settings**

La craneotomía descompresiva en bisagra como una alternativa para entornos de bajos recursos

Ernesto Enrique Horta-Tamayo1,2 <https://orcid.org/0000-0002-1292-1689>

Angel Jesus Lacerda-Gallardo3 <https://orcid.org/0000-0001-9171-2000>

1Universidad de Ciencias Médicas de Holguín "Mariana Grajales Coello". Holguín, Cuba.

2Hôpital de Référence de Maradi. Maradi, Niger.

3General Teaching Hospital "Roberto Rodríguez". Morón, Ciego de Ávila, Cuba.

\*Autor para la correspondencia. Correo electrónico: [ernestoht@infomed.sld.cu](mailto:ernestoht@infomed.sld.cu)

Dear Editor:

Much has been debated in recent decades about the role of decompressive craniectomy (DC) within the therapeutic algorithms for intracranial hypertension (ICH).(1)

The DECRA trial showed that bifrontal DC for moderate ICH is not useful, while the RESCUEicp trial found that last-level DC for severe and refractory intracranial pressure (ICP) can significantly reduce the mortality rate, but is associated with a higher rate of disability.(2)

In the Cuban context, *Lacerda-Gallardo* et al.(3) in a retrospective study of 230 cases, found a reduction below 20 mmHg in intracranial pressure in the immediate postoperative period in 50.9% of cases. Overall mortality was 28.7% per year.

Syndrome of the trephyned, hygromas/subdural effusions, rebleeding of the hematoma or increased area of hemorrhagic contusion, cerebrospinal fluid leaks, and hydrocephalus are some of the complications associated with DC.(1)

In an analysis of 33 cases submitted to cranial reconstructive procedures by *Lacerda-Gallardo* et al.,(4) 18% of the patients presented a syndrome of the trephyned and 15% showed complications associated with cranioplasty.

In this context, decompressive hinge craniotomy (DHC) arises, in an attempt to reduce these complications and avoid the need for deferred cranioplasty and higher hospital costs.(5)

However, this technique suffered some initial skepticism, given the possibility of its failure to effectively reduce ICP, which is apparently quite rare (around 2%), as published by *Layard Horsfall* et al. in a systematic review.(2)

In this regard, *Biroli* et al.(6) in an experimental study, demonstrated that despite the fact that the volume added to the supratentorial space after DHC is less than that provided by a traditional DC, both are greater than the volume of brain herniation reported in the literature in the clinical setting. Therefore, theoretically it is a valid option in case of potentially evolutionary lesions and non-massive edemas, especially in developing countries.

The use of DHCin neurosurgical practice may be advantageous compared to traditional DC. For example, it may help control moderate cerebral edema while avoiding the need for future cranioplasty.(2) The authors believe that in resource-limited settings, this is a value-added consideration.

In addition, axonal stretching is reduced and there are fewer complications typical of traditional DC (problems with CSF hydrodynamics, infection and resorption of the autologous bone flap).(2,5,7)

Despite the fact that there is a wide variety of techniques to achieve a floating bone flap, using miniplates/titanium screws or sutures,(2) authors consider that in low-income context, where the performance of beveled craniotomies with Hudson's trephine prevails, it is the “osteoplastic decompression” the most attractive. In this variant, the temporal muscle is used to partially secure the free bone flap.(7)

From the authors' point of view, DHC is an attractive alternative in settings with limited resources, with results equivalent to conventional DC, reducing classic complications and making subsequent cranial reconstructive procedures unnecessary. On the other hand, DHC could serve as an intermediary step between medical therapy and conventional decompressive craniectomy, in the lowest percentage of cases that require the latter, in the event of refractory ICH.

**BIBLIOGRAPHIC REFERENCES**

1. Lacerda Gallardo AJ, Abreu Pérez D, Lacerda Gallardo AJ, Abreu Pérez D. Decompressive craniectomy in severe neurotrauma. An Acad Cienc Cuba. 2022 [acceso: 23/08/2023];12(3): [aprox. 3 pant.]. Disponible en: <http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S2304-01062022000300031&lng=es&nrm=iso&tlng=es>

2. Layard Horsfall H, Mohan M, Devi BI, Adeleye AO, Shukla DP, Bhat D, et al. Hinge/floating craniotomy as an alternative technique for cerebral decompression: a scoping review. Neurosurg Rev. 2020;43(6):1493-507. DOI: 10.1007/s10143-019-01180-7

3. Angel Jesus LG, Daisy AP, Miguel de Jesus PM. Decompressive craniectomy in severe head injury. Experiences 18 years later. In: neurotrauma2021. 2021 [acceso: 23/08/2023]. Disponible en: <https://neurotrauma2021.sld.cu/index.php/neurotrauma/2021/paper/view/51>

4. Gallardo AJL, Martín Pardo JC, Martín Chaviano D, Tacas Gil N, Quintana Saez J, Mirabal García Y. Craneoplastia en pacientes con craniectomia descompresiva por un traumatismo craneoencefalico grave. Rev Chil Neurocir. 2013 [acceso: 23/08/2023];39(2):109-14. Disponible en: <https://go.gale.com/ps/i.do?p=IFME&sw=w&issn=07164491&v=2.1&it=r&id=GALE%7CA467681353&sid=googleScholar&linkaccess=abs>

5. Mracek J, Choc M, Mork J, Vacek P, Mracek Z. Osteoplastic decompressive craniotomy--an alternative to decompressive craniectomy. Acta Neurochir (Wien). 2011 [acceso: 23/08/2023];153(11):2259-63. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/21866327/>

6. Biroli A, Bignotti V, Biroli P, Buffoli B, Rasulo FA, Doglietto F, et al. Hinge craniotomy versus standard decompressive hemicraniectomy: an experimental preclinical comparative study. Acta Neurochir. 2023. DOI: 10.1007/s00701-023-05715-2

7. Adeleye AO. Clinical and Radiologic Outcome of a Less Invasive, Low-Cost Surgical Technique of Osteoplastic Decompressive Craniectomy. J Neurol Surg Part Cent Eur Neurosurg. 2016 [acceso: 23/08/2023];77(2):167-75. Disponible en: <https://pubmed.ncbi.nlm.nih.gov/26731715/>

**Conflict of interests**

The authors declare no conflicts of interest.

Recibido: 18/10/2023

Aprobado: 17/01/2024